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ABSTRACT

A 30-minute screening battery of tests and subtests selected from the complete 90-minute battery used in USOE Prekindergarten-Kindergarten research plus three locally developed instruments were identified as the most satisfactory single measures of cognitive, motor, auditory, visual, visual-motor coordination, and language development to provide an economical assessment of 4 to 6 year old children. The statistical analyses upon which test recommendations were based are reported. Although the 1961 Experimental Edition of the Illinois Test of Psycholinguistic Abilities was used in this study, the similarity and improvement of the subtests suggests that the desirability of introducing the 1968 Revised Edition in future testing. The appendix contains the locally developed measures: the Behavior Rating Scale (TM 000 185), the Three-Dimensional Auditory Discrimination Test (TM 000 186), and Gross Motor Observations (TM 000 187), and also lists the tests forming the complete 90-minute battery. (Author/PR)

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EARLY EDUCATION SCREENING TEST BATTERY of Basic Skills Development

A STUDY OF TEST SELECTION

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Office of
Research and Testing

SCHOOL DISTRICT OF UNIVERSITY CITY
University City, Missouri

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EARLY EDUCATION SCREENING TEST BATTERY
of Basic Skills Development

A STUDY OF TEST SELECTION

OVERVIEW

A 30-minute screening battery of tests and subtests selected from those of the complete 90-minute battery used in U.S.O.E. Prekindergarten-Kindergarten research were identified as the most satisfactory single measures of cognitive, motor, auditory, visual, visual-motor coordination, and language development to provide an economical assessment of four to six year old children. The statistical analyses upon which test recommendations were based are reported in the following pages. Although the 1961 Experimental Edition of the Illinois Test of Psycholinguistic Abilities was used in this study, the similarity and improvement of the subtests suggests the desirability of introducing the 1968 Revised Edition in future testing. Table 1 lists recommended tests.

Table 1. Early Education Screening Test Battery

Skill Area Measured	Test	Approximate Administration Time in Minutes
COGNITION	Peabody Picture Vocabulary Test (PPVT)	5 - 6
MOTOR	Gross Motor Observations (GMO)	2 - 3
AUDITORY	Illinois Test of Psycholinguistic Abilities (ITPA): Auditory Reception (AR), 1968 Revision	3 - 4
VISUAL	ITPA: Visual Reception (VR), 1968 Revision	3 - 4
VISUAL-MOTOR	Developmental Test of Visual-Motor Integration	5 - 6
LANGUAGE	ITPA: Verbal Expression (VE), 1968 Revision ITPA: Grammatic Closure (GC), 1968 Revision	4 - 5 3 - 4
BEHAVIOR	Behavior Rating Scale (BRS)	- -*
TOTAL TIME		25 - 32

*BRS is checked during testing.

INTRODUCTION

One outgrowth of the first year of the U.S.O.E. Prekindergarten-Kindergarten research study (1) was a recognition of the need to expand the personalized skills development program to reach more children. For this purpose, a 30-minute screening test battery was selected as a substitute for the complete 90-minute battery to provide quick and economical assessments of large numbers of candidates.

In the complete battery, three standardized tests and two instruments devised and normed locally were used to measure seven skill development areas (motor, auditory, visual, visual-motor coordination, language, retention, and cognition). Ability to count consecutively from 1 to 101, and a Behavior Rating Scale (local in origin) were used as supplementary measures. From 14 test scores (not including counting and the behavior observation), specific programs to meet major individual needs were recommended. Table 2 indicates the area to which each test or subtest relates. A more complete description of the tests is provided in Appendix A.

Table 2. Tests and Subtests Used in the Complete Test Battery

Abbreviation	Test Title
PPVT	Peabody Picture Vocabulary Test (2)
ITPA	Illinois Test of Psycholinguistic Abilities (3)
VMI	Developmental Test of Visual-Motor Integration (4)
BRS	Behavior Rating Scale -- Locally devised and normed (5, 6) See also Appendix B
3-AD	Three-Dimensional Auditory Discrimination -- Locally devised and normed (7) See also Appendix C
GMO	Gross Motor Observations -- Locally devised and normed (5, 8) See also Appendix D

EARLY SCREENING TEST BATTERIES

As adequate local data were not yet available from the first experimental year in March 1967, a group of test administrators, experienced in giving, interpreting, and programming from developmental skills tests, and teachers who had successfully used these individualized assessments in personalizing instruction, were asked to identify subtests from the complete battery, and from other sources, which would best identify children's basic perceptual and cognitive strengths and weaknesses. These subtests comprised the first screening instrument. Program recommendations based on the screening tests compared with those based on the complete battery for the same children were sufficiently dissimilar to suggest the need for further study of subtest selection.

The following year a revised screening test battery was identified from research data, again by comparing program recommendations based on the partial battery to the complete battery. The results which were found to be reasonably satisfactory in predicting major developmental needs of young children were reported in the spring of 1968 (5, 6, 8). A restudy of the revision is the subject of this report.

RESTUDY OF THE FIRST REVISION

Method.

Scores on 14 test variables, counting, and behavior were examined for a total of 149 boys and 171 girls. From these data programs for individual children in seven major areas of skill development needs were recommended. Table 3 reports these distributions which show the percentage of boys and girls to be approximately the same in four of the seven areas. Three exceptions indicate proportionately twice as many boys as girls with language deficits, five percent of girls and no boys with retention problems, and half again as many girls as boys with skills strongly intact.

Combining the sexes, the deficient groups, in percent, were: Language (L) - 16%; Motor (M) - 14%; Visual (V) - 10%; Auditory (A) - 4%; and Retention (R) - 3%; a total of 47 percent. In contrast, the intact group, weak and strong (W and I) combined, constituted 53 percent of all the children, indicating average or superior perceptual and cognitive skill development.

Raw score (RS), intelligence quotient (IQ), or language quotient (LQ) data from prekindergarten pretests of children in both the experimental and control groups (E4-5, C4-5) and from kindergarten posttests of children in the control group (C5-6) were analyzed. (The figures 4, 5 and 6 indicate age in years.) This selection provided information on children from 4 years, 0 months to 6 years, 6 months old.

Earlier in these examinations, data were treated separately for each group. The results were sufficiently similar in each instance to justify combining the groups for the present analysis.

Table 3. Number and Percent of Children Studied

Major Perceptual Skill Need	BOYS		GIRLS		TOTAL	
	Number	Percent	Number	Percent	Number	Percent
M - Motor	21	14	24	14	45	14
A - Auditory	7	5	6	4	13	4
V - Visual	18	12	15	9	33	10
L - Language	33	22	19	11	52	16
R - Retention	0	0	8	5	8	3
W - Weak Intact	33	22	35	20	68	21
I - Strong Intact	37	25	64	37	101	32
TOTAL	149	100	171	100	320	100

Analysis of Data.

The standard deviation (SD) of the mean score of the combined subgroups (E4-5, C4-5, C5-6) for each test variable was computed separately for boys and girls in the seven subgroups (M, A, V, L, R, W, I) as shown in Appendix E. These figures were converted to a percentage of children in each subgroup who equal or excel those in the total group on each test (9). Table 4 provides these data for children in the seven major skill areas.

The seven skill areas measured were: cognitive, motor, auditory, visual-motor integration, visual, language, and retention. The task of counting consecutively from 1 to 101, and behavior (providing patterns similar to those of cognition) were included as information useful to the teacher rather than as a measure of a specific skill need. A low percentage indicates lack of skill, a high percentage indicates superior skill compared with all children comprising the total group. In this analysis, 23 percent (-.75 SD) and below is considered a deficit in skill development, 77 percent (+.75 SD) and above identifies a strength.

In Table 4, one of four measures of cognition (PPVT) shows that only 20 percent of boys with motor skill weakness (M) equalled or excelled boys in the total group; 93 percent of boys in the strong intact group (I) surpassed the other boys. The figure 20 represents the lowest 20 percent; the figure 93 represents the highest seven percent (100 minus 93). The data for girls are interpreted in the same way.

In the motor area (M), only three percent of the boys equalled or excelled boys in the total group, indicating a marked deficit of the group in gross motor development. All other subgroups (A, V, L, R, W, I) scored average or above (49 to 80 percent). Data for the remaining skill area, both for boys and girls, are interpreted in the same manner.

DISCUSSION

All but one of the tests or subtests comprising the Complete Test Battery (exclusive of counting and the Behavior Rating Scale) appeared to be useful means of identifying both cognitive strengths (subgroups W, I) and one or more perceptual skill deficits (subgroups M, A, V, L, R). The exception, ITPA-4, did not pinpoint a deficit in any subgroup except A boys. However, some measures designed to test understanding tended to be better predictors than others of cognitive strength while some tests selected to sample perceptual or motor skills appeared to predict better than others weaknesses in basic skill development.

Measures of Cognitive Strength.

Of the four measures of cognition, the most predictive in terms of the percentage of children who equalled or excelled all others in the total group, in descending order were: ITPA-LQ, ITPA-3, ITPA-4, and PPVT-IQ. The ITPA-LQ being derived from nine subtests in the 1961 Experimental Edition and from ten subtests in the 1968 Revised Edition(10), was eliminated from consideration in a short screening test battery. ITPA-3 appeared to be the second best measure for boys, third best for girls. ITPA-4 shared first rank with ITPA-LQ for girls, fourth rank for boys. PPVT-IQ placed third and fourth for boys and girls respectively. The use of both ITPA-3 (Auditory Reception) and ITPA-4 (Visual Reception) as measures of cognition would have been ideal except for the administration time required. Thus, PPVT-IQ (Picture Vocabulary) was chosen as being the most feasible measure of cognitive strength. This test would be reinforced by a second measure, ITPA-5 (Verbal Expression), which appeared to be not only a test of language fluency but also was the best of all measures of cognition.

As a by-product, these data also revealed that PPVT-IQ, ITPA-LQ, and ITPA-3 were good identifiers of language deficiency.

Table 4. Percentage of Children by Major Skill Area Who Equal or Excel Those in the Total Group

Skill Measured by Specific Test		Sex	Major Perceptual Skill Area						
			M	A	V	L	R	W	I
COGNITION	PPVT-IQ (Form A)	B	20	34	83	16	-	43	93
		G	42	54	31	4	79	60	91
	ITPA-LQ	B	50	15	60	14	-	60	95
		G	27	33	27	19	57	61	98
	ITPA-3	B	34	13	74	20	-	56	94
		G	25	61	36	10	37	69	97
	ITPA-4	B	45	4	58	60	-	50	92
		G	24	43	21	39	30	67	98
COUNTING	1-101	B	9	27	80	44	-	44	93
		G	19	56	20	42	49	39	98
BEHAVIOR	BRS	B	20	41	38	72	-	12	96
		G	56	3	28	68	73	47	90
MOTOR	GMO	B	3	52	69	71	-	49	80
		G	2	67	45	45	56	77	88
	ITPA-6	B	42	21	65	13	-	52	96
		G	15	76	16	55	22	61	95
AUDITORY	ITPA-1	B	76	4	58	44	-	45	87
		G	42	4	46	39	86	54	89
	3-AD	B	61	13	20	32	-	74	93
		G	66	5	72	47	23	50	93
VISUAL-MOTOR	VMI	B	15	37	23	76	-	42	95
		G	22	72	13	48	23	66	96
VISUAL	ITPA-2	B	40	11	29	48	-	63	96
		G	33	50	8	13	80	77	90
LANGUAGE	ITPA-5	B	35	28	52	16	-	51	97
		G	25	50	33	14	45	61	98
	ITPA-7	B	18	18	84	24	-	58	91
		G	26	86	30	9	42	52	94
RETENTION	ITPA-8	B	70	13	79	11	-	45	87
		G	41	56	44	34	7	58	97
	ITPA-9	B	28	31	27	26	-	67	97
		G	16	18	46	51	30	75	97

Measures of Motor and
Perceptual Skill Deficits.

Tests of deficits in five basic skill areas, motor (M), auditory (A), visual (V), language (L), retention (R), also were identified. When two tests relating to a particular skill were examined, the test yielding the lower percentages of success was selected. A test of visual-motor integration measured both the V and M areas. The six tests selected to identify skill deficiency, together with the measure of cognition and behavior, are given in Table 5.

Motor Deficit. The Gross Motor Observations (GMO), devised and normed locally, proved to be more predictive of motor deficiency than ITPA-6, Manual Expression.

Auditory Deficit. ITPA-1, Auditory Reception, was more satisfactory than the Three-Dimensional Auditory Discrimination test (3-AD), devised and normed locally, which lacked sufficient ceiling for older children.

Visual-Motor Deficit. Visual-Motor Integration, the only test of eye-hand coordination, appeared to be a satisfactory measure of both motor and visual deficiency. However, in the population studied, this instrument was a better predictor of motor deficits of boys than girls and of visual deficits of girls than boys.

Visual Deficit. ITPA-2, Visual Reception, appeared to be a good predictor for girls but only fair for boys.

Language Deficit. Both ITPA-5, Verbal Expression, and ITPA-7, Grammatic Closure, together proved to be adequate predictors of language deficiency. PPVT appeared also to serve as a back-up test.

Retention Deficit. ITPA-8, Auditory Sequential Memory, appeared more effective than ITPA-9, Visual Sequential Memory, in predicting a memory weakness. However, in the interest of brevity and because few children in the total group had retention problems, neither test was included in the screening test battery.

THE EARLY EDUCATION SCREENING TEST BATTERY

The final selection of measures to comprise the screening test battery, Table 5, was a compromise between the predictability value of the test and administration time.

The research basis upon which the selection was determined employed the original editions of the Beery and ITPA instruments. However, in the proposed screening test battery, the revised editions are recommended for use. The Developmental Test of Visual-Motor Integration was changed but slightly and only in the elaboration of "right" and "wrong" scoring models given in the new manual. In the ITPA revision, the test administration has been simplified and scoring refined to provide more diagnostically useful measurements in the various skill areas.

Table 5. The Early Education Screening Test Battery

Area	Test Title	New Title, Revised Edition
COGNITION	PPVT, Peabody Picture Vocabulary	- - -
BEHAVIOR	Behavior Rating Scale	- - -
MOTOR	Gross Motor Observations	- - -
VISUAL-MOTOR	Beery-Buktenica: Developmental Forms Sequence	Beery: Developmental Test of Visual-Motor Integration, VMI
AUDITORY	ITPA-1, Auditory Decoding	Auditory Reception, ITPA
VISUAL	ITPA-2, Visual Decoding	Visual Reception, ITPA
LANGUAGE	ITPA-5, Vocal Encoding	Verbal Expression, ITPA
	ITPA-7, Auditory-Vocal Automatic	Grammatic Closure, ITPA

THE EVALUATION OF THE SCREENING TESTS

Progress in instrument selection for the present Early Education Battery is indicated in Table 6. Some tests and subtests withstood repeated evaluation, others were eliminated. In measuring cognition, the PPVT-IQ and ITPA-3 and -4 proved useful in identifying intact children with superior development in all skills areas. Counting consecutively from 1 to 101, and the Behavior Rating Scale identified strong, intact children but these scales did not seem to be related to growth in a specific basic skill.

To identify children with weaknesses in basic skills, the revised Gross Motor Observations proved more satisfactory than the original Total Motor Test or three of its subtests (hopping seven times on the right and on the left foot, and skipping, which were eliminated from the GMO) in pinpointing motor deficiencies. Auditory deficits were spotted more reliably by ITPA-1 than by PPVT-IQ. The VMI test continued to be a good to excellent test of visual-motor integration throughout the study although results were different for boys and girls. Boys with motor deficiencies and girls with visual deficiencies were best identified by VMI scores. In identifying visual deficits, ITPA-2 was more effective than either VMI or PPVT. ITPA-3 proved to be a fair to good, but not excellent measure to identify children with language deficiencies. ITPA-5 was an excellent test of language fluency and ITPA-7, used as a measure of syntax, was excellent for girls but only fair for boys. In selecting children with problems of retention (girls only), ITPA-8 was found to be more useful than ITPA-9.

The present selection of instruments to be included in a Screening Test Battery are listed in Table 1, page 1 in the Overview.

Table 6. Progressive Test and Subtest Selection for a Screening Test Battery

Skill Measured by Specific Subtest	First Selection July 1967	First Revision March 1968	Second Revision Sept. 1968	Rating of Second Revision
I -COGNITIVE - High Scores for the Intact Subgroup	PPVT-IQ ITPA-3	PPVT-IQ	PPVT-IQ ITPA-3 ITPA-4	Excellent Excellent Excellent
M -MOTOR - Low Scores for Motor Subgroup	Hop R.Foot HopL.Foot Skip	GMO	GMO	Excellent
A -AUDITORY - Low Scores for Auditory Subgroup	(PPVT-IQ)*	ITPA-1	ITPA-1	Excellent
V,M-VISUAL-MOTOR - Low Scores for Visual and Motor Subgroups	VMI	VMI	VMI	Good to Excellent
V -VISUAL - Low Scores for Visual Subgroup	(PPVT-IQ)* VMI	ITPA-2	ITPA-2	Fair for Boys Excellent for Girls
L -LANGUAGE - Low Scores for Language Subgroup	ITPA-5 ITPA-3	ITPA-5 ITPA-7	ITPA-5 ITPA-7	Excellent Fair for Boys Excellent for Girls
R -RETENTION - Low Scores for Retention Subgroup for Girls only	ITPA-8		ITPA-8 ITPA-9	Excellent for Girls Fair for Girls

*Secondary measurement of auditory and visual skill.

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APPENDIX A

THE COMPLETE ASSESSMENT BATTERY

(Including Three New Subtests of the 1968 Revised Edition of the ITPA)

DESCRIPTION OF ASSESSMENT TESTS	Variable	MAJOR DEVELOPMENTAL SKILL MEASURED[1]					Cognition
		M	A	V	L/E	R	
PEABODY PICTURE VOCABULARY TEST, I.Q. Ability to indicate the meaning of a spoken word by designating one of four pictures.	C[2]						Cog.
BEERY: DEVELOPMENTAL TEST OF VISUAL-MOTOR INTEGRATION (VMI). Perception of and ability to reproduce simple geometric forms.	D[3]	M		V			
ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES (Revised Edition), TOTAL ITPA L.Q. Composite Score derived from chronological age and total standard score.	C						Cog.
I. REPRESENTATIVE LEVEL							
A. ITPA- RECEPTIVE PROCESS. (Decoding.) Ability to comprehend visual and auditory symbols.							
Auditory Reception. (Auditory Decoding-ITPA-1.*) Ability to understand verbally presented materials.	D		A				
Example: Do chairs eat? Yes, No. Do ponies shave? Yes, No.							
Visual Reception. (Visual Decoding-ITPA-2.*) Ability to understand visual symbols.	D			V			
Example: Picture of a dog - Find another (different) dog.							

[1] M - Motor; A - Auditory; V - Visual; L/E - Language, Expression; R - Retention.

[2] C - Control Variable

[3] D - Dependent Variable

*Test designation of Experimental Edition, 1961, is given in parentheses.

Appendix A (continued)

DESCRIPTION OF ASSESSMENT TESTS	Variable	MAJOR DEVELOPMENTAL SKILL MEASURED[1] M	A	V	L E	R	Cognition
B. ITPA - ORGANIZING PROCESS. (Association.) Ability to relate, organize, and manipulate visual and auditory symbols in a meaningful way.							
Auditory Association. (Auditory-Vocal Association - ITPA-3.*) Ability to relate concepts presented orally. Example: A daddy is big, a baby is _____. Grass is green, sugar is _____.	D		A				Cog.
Visual Association. (Visual-Motor Association - ITPA-4.*) Ability to relate concepts presented visually. Example: Dog goes with the bone. Tennis ball goes with the racket.	D			V			Cog.
C. ITPA - EXPRESSIVE PROCESS. (Encoding.) Ability to use verbal or manual symbols to transmit an idea.							
Verbal Expression. (Vocal Encoding - ITPA-5.*) Ability to express concepts vocally. Example: "Tell me all about a - - - nail."	D				L E		
Manual Expression. (Motor Encoding - ITPA-6.*) Ability to express ideas manually. Example: "Show me what to do with a - - - hammer."	D	M		V	E		
II. AUTOMATIC LEVEL							
A. CLOSURE. Ability to fill in missing parts in an incomplete picture or verbal expression--to integrate discrete units into a whole.							

*Test designation of experimental edition, 1961.

Appendix A (continued)

DESCRIPTION OF ASSESSMENT TESTS	Variable	MAJOR DEVELOPMENTAL SKILL MEASURED					Cognition
		M	A	V	L E	R	
Grammatic Closure. (Auditory-Vocal Automatic - ITPA-7.*) Ability to respond automatically to often repeated verbal expression of standard American speech. Example: "Here is a dog, here are two _____."	D				L		
Supplementary Test 1. Auditory Closure. (ITPA-S1.) Ability to fill in the missing part of a word. Example: "What am I talking about -- Da/ y (Daddy), bo/ le (bottle)	D		A		L		
Supplementary Test 2. Sound Blending. (ITPA-S2.) Ability to synthesize the separate parts of a word. Example: d- og, ē - g, z - ē	D		A		L		
Visual Closure. (ITPA-VC.) Ability to identify a common object from an incomplete visual presentation. Example: Identify number of dogs in a picture in 30 seconds.	D			V			
B. SEQUENTIAL MEMORY. Ability to reproduce from memory a sequence of auditory or visual stimuli.							
Auditory Sequential Memory. (Auditory-Vocal Sequencing - ITPA-8.*) Ability to reproduce sequences of digits increasing in length from two to eight digits. Example: 2-2, 9-1, 6-4-9	D					R	
Visual Sequential Memory. (Visual-Meter Sequencing - ITPA-9.*) Ability to reproduce sequences of nonmeaningful figures. Example: ○ □, □/... ϕ ≠ ϟ ≠ ---	D					R	

*Test designation of experimental edition, 1961.

Appendix A (continued)

DESCRIPTION OF ASSESSMENT TESTS	Variable	MAJOR DEVELOPMENTAL SKILL MEASURED					Cognition
		M	A	V	L E	R	
GROSS MOTOR OBSERVATION. Ability to control and balance body. Example: Ability to jump on each foot, skip, walk a balance beam forward and backward.	D	M					
THREE-DIMENSIONAL AUDITORY DISCRIMINATION TEST. Ability to discriminate sounds from verbal and physical (toy) stimulus. Example: This is a mouse, this is a house. Give me the house.	D		A				
COUNTING. Ability to count consecutively from 1 to 101.	D						
BEHAVIOR RATING. Examiners subjective estimate of child's Independence, Concentration, Tractability, Attitude and Disposition Regarding Testing, Overflow Behavior.	D	Intra-Interpersonal Relations					
METROPOLITAN READINESS TESTS, FORM B. Readiness for the first primary year. Example: Word Meaning, Listening, Matching Alphabet, Numbers, Copying, Composite Score	D	Readiness					

APPENDIX B

NAME_____ DATE_____ EXAMINER_____

BEHAVIOR RATING SCALE

INSTRUCTIONS: Circle the Appropriate number and record score for each item in the box. Total the scores and record in the lowest box. Note global impression immediately at end of testing and record under REMARKS any behaviors of particular significance.

1. Independence

Unable to leave mother	Separates, but needs to return	Needs frequent reassurance	Needs occasional reassurance	Needs no reassurance	
0	1	2	3	4	☐

2. Concentration

Unable to attend	Extremely distractable	Needs frequent reminders of task	Needs occasional reminders of task	Unswerving absorption	
0	1	2	3	4	☐

3. Tractability

Negative, resistant, obstinate	Tests limits	Passive Compliance	Agreeable	Extremely Cooperative	
0	1	2	3	4	☐

4. Attitude and Disposition Regarding Testing

Very unhappy, insecure	Uncomfortable	Accepting	Enjoying, Pleased	Enthusiastic, Exhuberant	
0	1	2	3	4	☐

5. Overflow Behavior (squirming, nail biting, toe or finger tapping, etc.)

Obvious, multiple habitual	Frequent evidence	Occasional evidence	Isolated incidents	No evidence	
0	1	2	3	4	☐

TOTAL RAW SCORE ☐

REMARKS: _____

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APPENDIX C

THREE-DIMENSIONAL AUDITORY DISCRIMINATION TEST

Name_____ Sex_____ Date_____ Age_____

DIRECTIONS: Place one pair of items in the order listed on table in front of child. As you point to each say, "This is mouse. This is house. Give me house." Return items to box and place second pair in front of child. Continue in the same way.

Score: 1 if correct, 0 if wrong.

Score Underlined Word	Sound		
	Beginning	Middle	Ending
1. mouse - <u>house</u>			
2. <u>bow</u> - boat			
3. cap - <u>cup</u>			
4. <u>boat</u> - bowl			
5. <u>wing</u> - ring			
6. pin - <u>pan</u>			
7. cup - <u>pup</u>			
8. <u>bowl</u> - ball			
9. <u>bug</u> - bud			
10. gum - <u>gun</u>			
11. pitcher - <u>picture</u>			
12. <u>pole</u> - bowl			
Subtotal Right			
Total			

Examiner_____

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APPENDIX D

GROSS MOTOR OBSERVATIONS

Legal Name _____ Date _____ Examiner _____

School _____

		Raw Score	
		R	L
1.	HOPPING ON ONE FOOT 7 TIMES (Circle foot chosen first): SAY: "I want you to hop for me. Hop over to the _____ on just one foot." SCORE: Unable-0 Breaks-1 Heavy-2 Rhythmic-3	1.	
2.	HOPPING ON THE OTHER FOOT 7 TIMES: SAY: "Now hop back on the other foot." SCORE: Unable-0 Breaks-1 Heavy-2 Rhythmic-3	2.	
3.	JUMPING IN ONE PLACE 7 TIMES: SAY: "Jump up and down for me." SCORE: Unable-0 Awkward (heavy)-1 Rhythmic (light)-3	3.	
4.	SKIPPING: SAY: "Now, skip over to the _____." (Demonstrate if necessary.) SCORE: Unable-0 Step-Hops (stiff)-1 Rhythmic-3	4.	
5.	BALANCE BEAM FORWARD: SAY: "Start here (point to one end) and walk on the board." SCORE Walking Forward: Off more than twice-0 Off twice-1 Off once-2 Not off-3	5.	
6.	SCORE Balance Forward: Poor-0 Average-2 Good-3	6.	
7.	BALANCE BEAM BACKWARD: SAY: "Now walk backward on the board." SCORE Walking Backward: Off more than 3 times-0 Off 2 or 3 times-1 Off once-2 Not off-3	7.	
8.	SCORE Balance Backward: Poor-0 Average-2 Good-3	8.	
		TOTAL SCORE	

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APPENDIX E

STANDARD DEVIATIONS AND MEAN SCORES BY MAJOR SKILL NEED

In the present analyses, standard deviations (SD) and mean raw scores for each major skill group (M - motor, A - auditory, V - visual, L - language, R - retention, W - weak intact, I - strong intact) were computed separately by sex. SD's of plus and minus 0.75 were selected arbitrarily as points above and below which indicated definite group strengths and weaknesses. Using these SD points, +0.75 represents the highest 77 percent and -0.75 represents the lowest 23 percent of the total population used in this study as determined by a table of areas under a normal probability curve (9). Standard deviations and mean raw scores are given in Tables E-1 and E-2 respectively.

Table E-1. Standard Deviation Distribution of Mean Scores by Major Skill Need

Skill Measured by Specific Test		Sex	Major Perceptual Skill Need						
			M	A	V	L	R	W	I
COGNITION:	PPVT-IQ	B	- .85	- .40	.96	-1.00	-	- .18	1.47
		G	- .20	.10	- .49	-1.80	.80	.26	1.33
	ITPA-LQ	B	.01	-1.04	.25	-1.08	-	.26	1.62
		G	- .61	- .43	- .61	- .86	.17	.29	2.05
	ITPA-3	B	- .39	-1.13	.63	- .83	-	.14	1.57
		G	- .68	.27	- .35	-1.26	- .32	.49	1.85
	ITPA-4	B	- .12	-1.71	.20	.25	-	- .01	1.40
		G	- .72	- .17	- .80	- .29	- .52	.45	2.06
COUNTING:	1-101	B	-1.35	- .61	.83	- .15	-	- .16	1.44
		G	- .87	.15	- .83	- .21	- .03	- .29	2.09
BEHAVIOR:	BRS	B	- .84	- .24	- .30	.57	-	- .91	1.73
		G	.14	-1.85	- .57	.48	.60	- .07	1.28
MOTOR:	GMO	B	-1.93	.04	.50	.56	-	- .03	.85
		G	-2.06	.44	- .12	- .13	.16	.75	.96
	ITPA-6	B	- .21	- .82	.39	-1.12	-	.05	1.70
		G	-1.03	.70	- .98	.12	- .76	.27	1.68
AUDITORY:	ITPA-1	B	.72	-1.77	.20	- .14	-	- .13	1.13
		G	- .20	-1.80	- .11	- .28	1.06	.10	1.23
	3- AD	B	.29	-1.13	- .85	- .47	-	.65	1.51
		G	.41	-1.67	.59	- .07	- .74	.01	1.47
VISUAL-MOTOR:	VMI	B	-1.05	- .34	- .75	.70	-	- .20	1.64
		G	- .78	.59	-1.14	- .05	- .75	.40	1.74
VISUAL:	ITPA-2	B	- .25	-1.21	- .56	- .06	-	.33	1.75
		G	- .43	.01	-1.42	- .98	.83	.73	1.26
LANGUAGE:	ITPA-5	B	- .39	- .57	.04	- .99	-	.03	1.88
		G	- .68	.01	- .45	-1.06	- .13	.27	2.03
	ITPA-7	B	- .90	- .90	.98	- .72	-	.19	1.36
		G	- .63	1.08	- .52	-1.33	- .21	.06	1.54
RETENTION:	ITPA-8	B	.51	-1.13	.82	-1.22	-	- .12	1.14
		G	- .23	.15	- .15	- .41	-1.45	.21	1.89
	ITPA-9	B	- .57	- .49	- .60	- .64	-	- .44	1.86
		G	-1.00	- .91	- .11	03	- .53	.67	1.85

Table E-2. Mean Scores by Major Skill Need

Skill Measured by Specific Test		Sex	Major Perceptual Skill Area						
			M	A	V	L	R	W	I
COGNITION:	PPVT-IQ	B	106.47	108.28	113.77	105.87	--	109.17	115.80
		G	103.91	106.16	101.80	92.04	111.37	107.30	115.24
	ITPA-LQ	B	108.47	97.14	110.99	96.69	--	111.08	125.69
		G	100.12	101.83	100.06	97.67	107.62	108.99	125.79
	ITPA-3	B	12.33	10.71	14.55	11.36	--	13.48	16.61
		G	12.37	14.00	12.93	11.40	13.00	14.36	16.67
	ITPA-4	B	10.95	8.57	11.44	11.50	--	11.11	13.23
		G	9.70	10.50	9.60	10.32	9.99	11.39	13.73
COUNTING:	1-101	B	11.04	14.85	22.16	17.15	--	17.14	25.26
		G	9.83	15.83	10.06	13.69	14.74	13.25	27.20
BEHAVIOR:	BRS	B	13.80	14.57	14.49	15.60	--	13.72	17.07
		G	16.03	13.50	15.13	16.46	16.62	15.76	17.48
MOTOR:	GMO	B	5.56	12.14	13.66	13.87	--	11.90	14.83
		G	7.33	15.83	13.93	13.89	14.87	16.87	17.59
	ITPA-6	B	11.52	10.42	12.60	9.87	--	11.99	14.96
		G	9.49	12.66	9.60	11.59	9.99	11.87	14.46
AUDITORY:	ITPA-1	B	20.09	11.28	18.27	17.05	--	17.08	21.53
		G	16.83	12.66	17.06	16.62	20.12	17.62	20.56
	3-AD	B	11.28	10.85	10.94	11.05	--	11.38	11.64
		G	11.33	10.50	11.40	11.13	10.87	11.16	11.74
VISUAL-MOTOR:	VMI	B	4.66	5.57	5.05	6.90	--	5.75	8.10
		G	5.08	6.66	4.66	5.93	5.12	6.45	7.99
VISUAL:	ITPA-2	B	9.19	7.57	8.66	9.51	--	10.17	12.56
		G	8.20	8.83	6.80	7.43	9.99	9.85	10.60
LANGUAGE:	ITPA-5	B	10.33	9.85	11.44	8.78	--	11.42	16.21
		G	10.24	11.66	10.73	9.48	11.37	12.19	15.76
	ITPA-7	B	8.42	8.42	11.16	8.69	--	10.02	11.72
		G	8.41	11.33	8.60	7.20	9.12	9.59	12.12
RETENTION:	ITPA-8	B	18.71	14.42	19.55	14.17	--	17.05	20.37
		G	15.87	17.16	16.13	15.26	11.74	17.36	23.02
	ITPA-9	B	7.47	7.56	7.44	7.39	--	8.69	10.40
		G	5.99	6.16	7.66	7.93	6.87	9.13	11.34

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